Attachment A

DRAFT STATEMENT OF WORK (SOW)

I. BACKGROUND

The Office of Space and Defense Power Systems, (NE-34), is responsible for the development, design, production, testing, acceptance, and delivery of radioisotope power systems (RPS) for use in space exploration or national security applications. In particular:

- This effort involves both System Integrating Contractors and facilities at DOE laboratories.
- For space missions, the effort also involves providing assistance for launch operations at the launch site.
- With this effort, NE-34 maintains the unique program and facility infrastructure that enables the Department to develop and deliver these systems.
- NE-34 also directs and manages the system integrating contractors that are involved in the program.
- In addition, NE-34 is responsible for managing the development of advanced technologies that may be used in future systems.

The purpose of this procurement is to obtain a Contractor that can provide advice and assistance to NE-34 program managers as they carry out their program responsibilities.

II. SCOPE

The contractor is to perform advisory and assistance activities to the key programmatic responsibilities and functions of the NE-34 Office as delineated below:

1. Space Radioisotope Power Systems: Evaluate and assess ongoing power system development efforts, provide analysis of heat source impact modeling, and provide advice and assistance in the form of recommendations and analysis concerning conceptual designs for prospective future National Aeronautics and Space Administration (NASA) missions.

2. Terrestrial Radioisotope Power Systems: Evaluate and assess ongoing power system development efforts and provide advice on heat source modeling and provide advice and assistance in the form of recommendations and advice concerning conceptual designs for potential future applications.

3 Launch Operations Assistance: Provide operational and technical assistance for contingency planning, emergency response planning and preparations, ground transportation, and handling activities involving DOE provided radioisotope power systems.

4. Space Reactor Power Systems: Assess and provide advice and assistance in the form of recommendations concerning ongoing technical development efforts and provide recommendations and analysis concerning conceptual designs for potential future system development.

5. Project Management Assistance: Execute for NE-34 a project management system that integrates the schedule and cost information for the contractors and laboratories involved in the design, development and delivery of radioisotope power systems. Where required, provide an on-site presence at system integration contractor sites and other areas specified by NE-34 to monitor, advise, and assist in the assessment of program status and progress.

6. General Program Assistance: Provide programmatic advice and assistance in the review and conduct of NE-34's overall radioisotope and space reactor power system programs, and maintain a repository of applicable documents and information.

7. Nuclear Safety Analysis: Provide assistance and advisory services related to safety reviews and analysis, to environmental safety and biological risk assessments, analysis of heat source impact, thermal, and structural modeling, and to launch meteorological analysis used in the preparation of environmental impact statements and safety analysis reports.

The Contractor must furnish all personnel, facilities, equipment, supplies and materials required to accomplish the work under this Task Order.

III. LOCATION OF WORK:

Since day-to-day interaction with NE-34 is a requirement for this effort, the Contractor shall maintain its primary facility within 30 miles of the NE-34 Germantown Office. Work will be performed at the contractor's facility and will also require travel to DOE Headquarters buildings at the Germantown (Germantown, MD), Pacific Northwest National Laboratory (Richland, WA), Oak Ridge National Laboratory (Oak Ridge, TN), Argonne National Laboratory-West (Idaho Falls, ID), Los Alamos National Laboratory (Los Alamos, NM), and the following NON-DOE Facilities: Teledyne Energy Systems (Hunt Valley,

MD), NASA Glenn Research Center Cleveland, OH), NASA Johnson Space Center (Houston, TX), NASA Marshall Space Flight Center (Huntsville, AL), Applied Physics Laboratory (Laurel, MD), John F. Kennedy Space Center (Kennedy Space Center , FL), Sterling Technology Corporation, (Kennewick, WA), Jet Propulsion Laboratory, (Pasadena, CA), Duratek Federal Services, (Richland, WA), Boeing Co (Canoga Park, CA), Lockheed Martin Space Systems Co. (Philadelphia, PA) and other possible locations.

IV. PERFORMANCE REQUIREMENTS

The following performance measures and performance expectations apply to the Performance Objectives:

Performance Measures	**Performance Expectations**
(a) Accuracy	As defined in Task Assignments, guidance, and reports.
(b) Quality of Documentation	100% conformance of deliverables compliant with applicable policies, procedures, and program quality requirements.
(c) Timeliness	Completion of scheduled tasks within 95% of due date.
(d) Cost Control	All tasks completed within 95% of budget.

A monthly report that summarizes the status of task assignments relating to program deliverables and monthly costs shall be submitted to NE-34. As designated in the Task Assignment documentation Where appropriate, individual Task Reports will be prepared and to NE-34.

Semiannually, DOE will formally evaluate the Contractors' performance. The evaluation elements may include management, technical, quality (completeness, accuracy, and effectiveness), timeliness, and cost. Concurrently, the Contractor will perform self-evaluation of Task Order performance and report results to NE-3

V. PERFORMANCE OBJECTIVES

Since each task is related to a particular power system which applies to one or more programs, the Contractor shall report evaluations/assessments to the Contracting Officer Representative (COR) on a monthly basis and to all applicable program managers on an as required basis. The

Contractor personnel shall draw upon their knowledge and multiple years of experience related to Space Reactors and Radioisotope Power Systems (RPS) to evaluate alternative approaches and policies and to offer advice and make recommendations on program execution. A listing of the technical capabilities that is required by the Contractors is included in the list of position descriptions. The relationship between the Contractor and other parties involved in the NE-34 programs will be defined in Interface Working Agreements.

A. TECHNICAL REQUIREMENTS

The contractor shall furnish all services, facilities, equipment; except for the government furnished equipment listed herein, necessary for providing advisory and assistance services to NE-34 in the technical areas described below. The contractor will be required to travel during the performance of this Task Order. Where required, the Contractor will provide assistance to NE-34 at the following locations: Washington, D.C. metropolitan area; Systems Integrator facilities in Pennsylvania (Philadelphia), Maryland (Baltimore), California (Canoga Park), and Washington (Richland/Kennewick/Pasco); DOE laboratories and field offices in Idaho (Argonne National Laboratory-West), Tennessee (Oak Ridge National Laboratory), New Mexico (Los Alamos National Laboratory); and other possible locations. This assistance will include involvement as advisors, reviewers, initiators, and evaluators for technical meetings. Typical yearly travel requirements are summarized in Attachment A. Contractor personnel will be required to work in sensitive defense facilities and with access to classified information and will be required to have a "Q" type security clearance. On-site technical representatives will be required at selected DOE contractor sites. Since day-to-day interaction with NE-34 is a requirement for this task order, the Contractor shall maintain its primary facility within 30 miles of the NE-34 Germantown Office. The Contractor shall have a conference room available for DOE use which contains operating project management visual equipment which is suitable for groups up to 50 people. The Contractor shall also provide an approved facility where classified information can be stored and accessed and have the Security Officer onsite.

B. WORK AREAS

The Task Assignments will be related to one of the following performance objectives:

Work Area 1: Space Radioisotope Power Systems

The Contractor shall assess and advise NE-34 on current and projected U.S. space missions that are using or may use radioisotope power systems. The Contractor will evaluate ongoing power system development and production efforts to accomplish these missions and will offer advice concerning these development and production programs. For example, the Contractor will evaluate the ongoing Multi-Mission RTG and the Stirling Radioisotope Generator systems being developed for future Mars, Lunar, or outer space missions. The Contractor shall

also evaluate other possible missions and generator systems from the standpoint of assessing radioisotope power requirements and power source designs. The Contractor shall assist NE-34 in formulating the technical objectives for these potentially new or improved space radioisotope power systems. In all of these areas, the Contractor's assistance may include an examination of possible heat source and converter design concepts for improved performance, reliability, and safety. It may include an evaluation of various design attributes in meeting the overall mission requirements. It may also include providing analysis and advice concerning the hydrocode modeling of heat source impact configurations and reentry scenarios. Activities will include reviews of plans and procedures for the fabrication of piece-parts and components and for the assembly and testing of converters at the systems contractor and the fueling of generators at the DOE fueling facility at the Idaho National Laboratory (INL). In addition, the Contractor shall participate in technical reviews of the heat source component fabrication and certification at Oak Ridge National Laboratory (ORNL) and Los Alamos National Laboratory (LANL).

Work Area 2: Terrestrial Radioisotope Power Systems

The Contractor shall assess and advise NE-34 on current and projected U.S. terrestrial applications that use or are projected to use RPS. The Contractor will evaluate ongoing power system development and production efforts to accomplish these missions and will offer advice concerning these programs. For example, the Contractor will evaluate and assess possible refurbishment actions for existing Radioisotope Thermoelectric Generators (RTGs). Similarly, the Contractor will review the technical status and progress towards meeting development objectives and schedules. The Contractor shall also assess possible future missions from the standpoint of evaluating radioisotope power requirements and power source designs. The Contractor shall assist NE-34 in formulating technical objectives for developing improved or new terrestrial power systems for these potential applications. This assistance may include an examination of possible heat source and converter design concepts for improved performance, reliability, and safety. It may include an evaluation of various design attributes (impact and other mechanical properties) in meeting the projected overall mission requirements.

Work Area 3. Launch Operations Assistance

The Contractor will assist NE-34 in providing launch operations assistance to NASA space missions that use nuclear power systems. These launch operations include (1) input to mission contingency planning, (2) emergency response planning and preparations in the event of an accident, (3) ground operations related to the handling of nuclear materials, (4) provide launch meteorology analysis for launch decisions, and (5) transportation and handling activities involving DOE provided radiological materials.

Work Area 4: Space Reactor Power Systems

The Contractor shall provide advice and assistance to NE-34 concerning ongoing or projected technology development activities and projected future space mission applications involving space reactor systems. Assessments and analyses conducted as part of this effort will center on reactor system designs for future space missions (both power and propulsion) and shall be conducted and provided to DOE to accomplish program planning and coordination efforts. Specific activities may include the following; (1) survey, summarize, and assess existing and forthcoming NASA and DOE preliminary studies of reactor systems for future missions and attend related technical meetings designated by DOE NE-34; (2) examine ongoing and future NASA missions for electric power and process heat for surface plants and assess respective capabilities of various candidate reactor systems to meet mission requirements, and (3) assess ongoing development status of reactor systems identified as prime candidates for future missions by NASA or DOE and make recommendations concerning key required development activities and related schedules.

Work Area 5. Project Management Assistance

The Contractor shall provide project management integration to assess the progress of major NE-34 projects using primavera and performance collection systems. An automated project management system (PMS) shall be used by the Contractor to develop, assemble and monitor an integrated project baseline of the major projects. This includes a work breakdown structure, time scaled schedule logic, and cost projections developed in concert with participating DOE project contractors, Laboratories, and other organizations. With an established baseline, project participants will transmit data directly to the Contractor for integration and the development of monthly earned-value reports in a variety of formats. Other reports may also be required on an as-needed and high priority basis. PMS-based data systems are in place for NE-34 technology programs using Primavera software.

Where required by NE-34, the Contractor will provide on a semi-permanent basis a daily presence at designated project contractor facilities to expedite coordination between the designated contractor and NE-34. The Contractor will assist NE-34 and provide it with technical evaluation/assessment to assure and verify that the designated contractor(s) are performing design, fabrication, testing, operations, and maintenance in accordance with their respective task order requirements. The Contractor's activities will include but not be limited to evaluation of both flight and ground demonstration testing, review of assessments, design and document reviews, planning, and product acceptance. In addition, the Contractor will participate in procedure reviews, readiness reviews, and other activities, as required, to meet the objectives of the applicable NE-34 missions.

Work Area 6. General Program Assistance

The Contractor shall provide a broad array of general program assistance to NE-34. This assistance shall include the following types of efforts: (1) The Contractor shall maintain an NE-34 documentation center for all program technical areas using an existing automated inventory and retrieval system. This requires data entry and preparation of abstracts. Associated file cabinets, video equipment, and classified safes will be provided as Government Furnished Equipment as designated on the attached list; (2) The Contractor shall review and assess existing or future facilities and operations at various DOE sites participating in NE-34 programs, including the purchase of plutonium-238, and provide recommendations to NE-34; (3) The Contractor shall identify potential new users and uses of nuclear power systems through periodic review of literature, and attendance at meetings and conferences and report information to NE-34 in the monthly report; (4) The Contractor shall conduct selected technical studies on an as-needed basis for NE-34. For `example, studies may be required for improving RTG or heat source safety, reliability, performance, and producibility, and analyzing RTG shipping containers. Selected technical papers related to these efforts may be prepared for various conferences; (5) The Contractor will assist NE-34 in the preparation and review of key program and project documents, such as participant interface agreements, product specifications and project plans; and (6) The Contractor will assist NE-34 in the preparation of presentations and meeting materials, often required on a rapid response basis. The contractor's facility will be located such that the program manager and designated key personnel can be present at NE-34's office, DOE-HQ Germantown, within approximately one hour. The contractor will have a conference room available for DOE use and which contains operating Project Management visual equipment and schedule display boards and which is suitable for groups up to 50 people.

Work Area 7. Nuclear Safety Analysis Assistance

The Contractor shall provide advice and assistance in evaluating the safety analysis and documentation that will be used in making recommendations and decisions concerning the public or environmental safety of the radioisotope and/or space reactor systems that are developed by the program. The Contractor will provide assistance in evaluating the methodology and adequacy of the models and analysis codes used in preparing risk assessments that are developed as input into missions Environmental Impact Statements or launch approval Safety Analysis Reports. These codes and risk assessments will address meteorological conditions, biological impacts that could result from releases, and overall probabilities of occurrence. Where appropriate, the Contractor will conduct independent analysis or modeling to check or confirm results from ongoing program efforts to provide independent risk or safety assessments.

C. WORK AREA/PERFORMANCE REQUIREMENTS.

Performance Measures	Performance Expectations
Accuracy	As defined in Task Assignments, guidance, and reports.
Quality of Documentation	100% conformance of deliverables compliant with applicable policies, procedures, and program quality requirements.
Timeliness	Completion of scheduled tasks within 95% of due date.
Cost Control	All tasks completed within 95% of budget.

VI. TRAVEL REQUIREMENTS

Travel is required under this task order and the contractor will strictly adhere to Federal Travel Regulations governed by 41 Code of Federal Regulations (CFR) chapters 300-304, which implements statutory requirements and Executive branch policies for travel by federal civilian employees and others authorized to travel at government expense. Travel costs and Other Direct Costs (ODCs) shall be incurred only with approval of the COR. The contractor will be required to travel during the performance of this task order. Where required, the Contractor will provide assistance to NE-34 at the following locations: Washington, D.C. metropolitan area; Systems Integrator facilities in Pennsylvania (Philadelphia), Maryland (Baltimore), California (Canoga Park), and Washington (Richland/Kennewick/Pasco); DOE laboratories and field offices in Idaho (Argonne National Laboratory-West), Tennessee (Oak Ridge National Laboratory), New Mexico (Los Alamos National Laboratory); and other possible locations.

VII. DELIVERABLES AND MILESTONES

The contractor must prepare and deliver all deliverables/reports as specified in the task order, by the dates also specified in the task order as directed by the Reporting Requirements Checklist (Attachment ??).

VIII. REPORTS.

A monthly report that summarizes the status of task assignments relating to program deliverables and monthly costs will be prepared and submitted to NE-34. Where appropriate, individual Task Report will be prepared and submitted as designated in the Task Assignment documentation to NE-34.

IX. PERFORMANCE EVALUATION.

Semiannually, DOE will formally evaluate the Contractors' performance. The evaluation elements may include management, technical, quality (completeness, accuracy, and effectiveness), timeliness, and cost. Concurrently, the Contractor will perform self-evaluation of Task Order performance and report results to NE-34.